

REMARKS

Status of the Claims

Claims pending in the above-identified application are Claims 1-6 and new Claims 22-33. Support for the new claims can be found generally throughout the specification, and in particular, on page 2, lines 14-19, and page 15, lines 2-10. The amendment does not introduce new matter into the above-identified application.

The Rejections Under 35 U.S.C. § 102(b)

Claims 1, 2, and 4 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,778,661 to Avidan et al. (*Avidan*). Respectfully, this rejection is traversed. Applicants respectfully request this rejection be withdrawn in view of the following remarks.

The invention as claimed in Claim 1, from which Claims 2 and 4 depend, is directed to an olefin trimerization system. The system in combination comprises a reactor, first and second inlet lines operably and independently connected into the reactor, a reactor effluent line from the reactor and a separator operably connected to the reactor effluent line. The first inlet line delivers olefin reactant to the reactor. Catalyst is delivered to the reactor via the second inlet line, and the second inlet line is located to provide thorough contact of the olefin reactant and the catalyst in the reactor. Olefin reactant, catalyst and trimerization reaction products are transferred from the reactor via the reactor effluent line. The separator separates desired trimerization reaction products. As claimed in new Claim 22, the reactor is selected from a solution reactor, a slurry reactor, or a gas phase reactor.

The above-referenced Office Action states that *Avidan* discloses a reactor (2), a first inlet line (23) for olefin reactant, a second inlet line (14) for catalyst, an effluent line (46) from the reactor for transferring olefin, catalyst and reaction products (column 7, lines 23-26) and a separator connected to the effluent line to separate desired products (column 7, lines 29-32). According to the Office Action, the first and second inlet lines are separate from one another and located in

the reactor to provide contact within the reactor of the materials they carry (column 6, line 59, through column 7, line 3).

Avidan describes a reaction process using a fluidized bed reactor. For example, please see column 2, lines 34-51, and column 6, line 11 and lines 59-60. Referring to Figure 1 of *Avidan*, the drawing clearly indicates that line 10 removes catalyst from the reactor. As stated at column 6, lines 44-45, "[t]he system provides for withdrawing catalyst from above grid 8 by conduit means 10." Further, at column 7, lines 14-26, *Avidan* states:

A plurality of sequentially connected cyclone separator means 30, 32 and 34 provided with diplegs 36, 38 and 40 respectively are positioned in an upper portion of the reactor vessel comprising dispersed catalyst phase 28.

The product effluent separated from catalyst particles in the cyclone separating system then passes to a plenum chamber 42 before withdrawal via conduit 46, operatively connect[ed] with effluent separation system 50. The product effluent is cooled and separated to recover C5+ liquid hydrocarbons, gaseous recycle or offgas along with any by product water or catalyst fines carried over.

As indicated in Figure 1, catalyst is concentrated at grid 8 as a result of discharge from the cyclone separators. Although *Avidan* indicates that "catalyst fines" may carrier over from the cyclone separators into the effluent line, catalyst fines do not equate to a transfer of the catalyst which is introduced into the reactor. In contrast to the claimed invention, *Avidan* clearly teaches removal of catalyst from the reactor via line 10, the same as a "second effluent line". Actually, the presence of the cyclone separators and line 10 teach away from the claimed reactor effluent line for transferring olefin reactant, catalyst and trimerization reaction products. Clearly, *Avidan* requires separation of the catalyst from the trimerization reaction products prior to the trimerization reaction products being discharge from the reactor. Thus, by requiring a "second effluent line", *Avidan* does not teach or suggest Applicants'

claimed combination of elements. Accordingly, Applicants respectfully request that the rejections of Claims 1, 2 and 4 under 35 U.S.C. § 102(b) be withdrawn.

The Rejections Under 35 U.S.C. § 103(a)

Claim 3 is rejected under 35 U.S.C. § 103(a) as being unpatentable over *Avidan* in view of U.S. Patent No. 5,689,028 to Lashier et al. (*Lashier*). This rejection is respectfully traversed.

Claim 3 depends from Claim 1. As discussed above, *Avidan* requires a "second effluent line" and does not teach or suggest Applicants' claimed combination of elements. *Lashier* does not teach or suggest that the reactor is operably connected by separate inlet lines to both a source of catalyst and a source of olefin reactant and that these two inlet lines are so arranged in respect to the reactor that the materials transferred in these lines are thoroughly contacted in the reactor. Further, as indicated in the Office Action, *Lashier* employs a gas phase catalyst system. *Avidan* employs a fluidized bed catalyst system. Accordingly, *Avidan* and *Lashier* are not compatible and one of ordinary skill in the art would not be motivated to employ *Lashier* to supplement the deficiency of *Avidan*. Further, *Avidan* teaches removal of catalyst from the trimerization reaction products prior to discharging the trimerization reaction products from the reactor. Thus, there is no need or desire for a catalyst deactivator to be introduced into the effluent stream of *Avidan*. Therefore, for the foregoing reasons, there is no motivation to one of ordinary skill in the art to combine the respective aspects of *Avidan* and *Lashier*. Accordingly, Applicants respectfully request the rejection of Claim 3 under 35 U.S.C. § 103(a) over *Avidan* in view of *Lashier* be withdrawn.

Claim 5 is rejected under 35 U.S.C. § 103(a) as being unpatentable over *Avidan* in view of U.S. Patent No. 4,788,366 to Harandi et al. (*Harandi*). Respectfully, this rejection is traversed.

The reactor of the claimed invention is operably connected by separate inlet lines to both a source of catalyst and a source of olefin reactant. These two inlet lines are so arranged in respect to the reactor that the materials transferred in the lines

are thoroughly contacted in the reactor. As discussed above, *Avidan* requires a "second effluent line" and does not teach or suggest Applicants' claimed combination of elements. *Harandi*, like *Avidan*, is directed to a fluidized bed reactor system. See column 6, lines 15-16. As illustrated in FIG. 2 of *Harandi*, feed inlet line 210 is shown connected to catalyst inlet line 250, thus catalyst inlet line 250 is not separate from the feed inlet line 210. As recited in Claim 1, from which Claim 5 depends, the first inlet line for olefin reactant and the second inlet line for catalyst are independent from one another. Further, *Harandi*, like *Avidan*, shows a "second effluent line" or catalyst outlet means 228 in FIG. 2. "Catalyst outlet means 228 is provided for withdrawing catalyst from above bed 224 and passed for catalyst regeneration in vessel 230 via control valve 229." Therefore, *Harandi* fails to supplement the deficiencies of *Avidan*. Thus, neither *Harandi* or *Avidan*, alone or in combination, teach or suggest each and every element of the claimed invention. Accordingly, Applicants respectfully request that the rejection of Claim 5 under 35 U.S.C. § 103(a) over *Avidan* in view of *Harandi* be withdrawn.

Claim 6 is rejected under 35 U.S.C. § 103(a) as being unpatentable over *Avidan* in view of U.S. Patent No. 5,521,264 to Mehra et al. (*Mehra*). Applicants respectfully traverse the rejection.

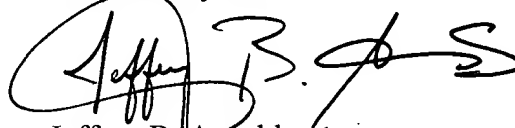
Claim 6 depends from Claim 1, and there is no citation of disclosure in *Mehra* that supplements the deficiency of *Avidan* with respect to the first and second inlet lines and the reactor effluent line of the claimed invention. According to the Office Action, *Mehra* teaches the use of a solvent to absorb ethylene, higher alpha olefin comonomers, and heavier hydrocarbons (col. 13, lines 61-65). However, the discussion in *Mehra* that the Office Action refers to is directed to a vent gas absorption unit, NOT a reactor. See column 13, lines 11-13, lines 21-23, and lines 30-32. Specifically, *Mehra* states "[a]n absorption solvent stream 98 is pumped into the top of the absorber stripper..." See also *Mehra*, FIG. 2. Therefore, there is no teaching or suggestion in *Mehra* or *Avidan* that "the inlet line from the source of catalyst system further comprises a reactor inlet operably connected from a source of

trimerization reaction solvent” as claimed in Claim 6. Thus, *Mehra* fails to supplement the deficiency of *Avidan* and neither *Mehra* nor *Avidan*, either alone or in combination, teach or suggest the claimed invention. Accordingly, Applicants respectfully request the rejection of Claim 6 under 35 U.S.C. § 103(a) over *Avidan* in view of *Mehra* be withdrawn.

CONCLUSION

In view of the foregoing remarks, Applicants respectfully assert that the rejection of the claims as set forth in the Office Action have been addressed and overcome. Applicants further respectfully assert that all claims are in condition for allowance and requests that an early notice of allowance be issued. If issues may be resolved through Examiner's Amendment, or clarified in any manner, a call to the undersigned attorney at (404) 745-2461 is respectfully requested.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Jeffery B. Arnold", with a large, stylized initial "J" and "B".

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